

PATENT ABSTRACTS OF JAPAN

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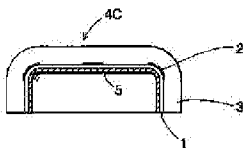
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(21)Application number : 03-343676 (71)Applicant : DAINIPPON PRINTING CO
LTD

(22)Date of filing : 25.12.1991 (72)Inventor : NEZU YOSHIAKI

(54) MANUFACTURE OF RESIN MOLDED PRODUCT



(57)Abstract:

PURPOSE: To manufacture a beautiful product without unevenness in color by forming a pattern printed layer with a pattern whose rear face can be viewed through on a transparent thermoplastic base or a base material sheet, laminating transparent thermoplastic resin over the layer and then forming a color coating material on one face of a processed product after the bending or drawing process.

CONSTITUTION: A pattern printed layer 2 with a through-view pattern is printed directly on a resin sheet or a sheet 1 or by the transfer process or the like on a transparent thermoplastic resin base on a base sheet 1. A transparent thermoplastic resin layer 3 selected properly based on the required height of processability and the use of a molded product is formed on the printed layer and laminated thereon. A laminate is processed by a bending or drawing means such as vacuum molding, press molding, air compression molding or the like, and then a colored coating material selected, transparent or of masking properties, is applied to one face of a processed product by an optional method such as spray coating or brushing.

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CLAIMS

[Claim(s)]

[Claim 1] The manufacture approach of the resin mold goods which prepare the
pattern printing layer which had the pattern which can look at a rear face through
a fluoroscope on the substrate of transparent thermoplastics, consider as a
printing hand, and consist this printing hand of forming the paint film of a coloring
coating in one field of a workpiece bending or after carrying out spinning.

[Claim 2] The manufacture approach of the resin mold goods which prepare the
pattern printing layer which had the pattern which can look at a rear face through
a fluoroscope on the base material sheet of transparent thermoplastics, or the
substrate, make the layer of thermoplastics transparent on it a layered product,
and consist this layered product of forming the paint film of a coloring coating in
one field of a workpiece bending or after carrying out spinning.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the manufacture approach of the resin mold goods suitable for using it as an organ bath or various kinds of containers.

[0002]

[Description of the Prior Art] For example, the resin mold goods used for an organ bath are the mold goods of transparent thermoplastics, and there is much what gave the design which prepared the pattern printing layer which can be looked at through a fluoroscope outside, and performed coloring solid printing from on the further. One method of manufacturing this kind of mold goods is the approach of carrying out spinning of the plate of thermoplastics and painting to it with a thermal-ink-transfer-printing method or a water pressure replica method. However, by the thermal-ink-transfer-printing method, when a configuration is complicated (for example, when it has a deep crevice), it may be difficult to imprint a pattern printing layer completely, and a pattern may be missing. Although there is such no problem in a water pressure replica method, a process is complicated, muffle painting takes time amount, and a cheap product is not obtained.

[0003] It is and the manufacture approach of a paralysis convex consists of carrying out the laminating of the film of the thermoplastics which printed directly the pattern printing layer and coloring solid printing layer which can be looked at through a fluoroscope, or printed them to the plate of thermoplastics, and carrying out bending of the obtained layered product. the part which the printing layer of the part which carried out and carried out bending of the coloring solid printing layer inside cringed, and became dense, carried out the coloring solid printing layer outside, and carried out bending conversely by a color becoming deep when manufactured by this approach -- a printing layer -- being extended -- rough -- a color becomes it thin that it is ****. If a shade is in the color of a solid printing layer, the amount of color mixture with a pattern printing layer will change, and it will change to the hue of a pattern in a bending part. For this reason, the quality with color nonuniformity of the mold goods obtained was low.

[0004]

[Problem(s) to be Solved by the Invention] The purpose of this invention is to offer the approach of manufacturing the resin mold goods which it can carry out without adopting a troublesome printing means, and there is no color nonuniformity, and have a beautiful appearance.

[0005]

[Means for Solving the Problem] The typical and desirable mode of the manufacture approach of the resin mold goods of this invention As shown in drawing 1 , a pattern printing layer (2) with the pattern which can be seen through on the substrate of transparent thermoplastics or a base material sheet (1) is prepared. The layer (3) of thermoplastics transparent on it is formed, and it considers as a layered product (4A), and bending or after carrying out spinning, it becomes a configuration as shows this layered product to drawing 2 from forming the paint film (5) of a coloring coating in one field of a workpiece (4B). Thus, resin mold goods (4C) as shown in drawing 3 are obtained.

[0006] It moves from the fundamental mode of this invention to processing immediately without forming the layer (3) of the transparent thermoplastics

prepared on a substrate or a base material sheet.

[0007] As an example of the ingredient used as the substrate or base material sheet of transparent thermoplastics, the acrylic resin, styrene resin, and polycarbonate resin which are the independent complex or copolymers of acrylic ester (meta), such as the Pori (meta) methyl acrylate, the Pori (meta) ethyl acrylate, and polyacrylic acid butyl, are mentioned. Especially the suitable thing for because of that of the high workability and transparency is acrylic resin. In order to prepare a pattern printing layer with the pattern which can besides be seen through, you may print on a direct resin plate or a sheet, and it is good also by the replica method. Printing of a pattern should just follow known technique, such as a screen method and the gravure method. In addition, a crevice is filled up with ionizing-radiation hardenability ink at least, and while irradiating superposition and ionizing radiation on a resin film on it and pasting up ink on a film, after [a roll intaglio which is indicated by JP,2-131175,A, for example] making it harden, you may print by the so-called drum printing method which consists of removing a film from a roll intaglio. In addition, "transparence" here includes both transparency and colorlessness coloring transparence and gloss ** transparence. What is necessary is just to add a known coloring agent and a known flatting agent, in order to make it coloring transparence or gloss ** transparence.

[0008] When what mixed a polyvinyl chloride, or vinyl chloride and a vinyl acetate copolymer and acrylic resin uses the substrate or sheet of acrylic resin as a vehicle of printing ink, adhesion with that is good and desirable. In addition, a cellulose system, a styrene system, etc. respond to the ingredient made into the object of printing, and it is *****.

[0009] Patterns are arbitration, such as grain, grain, grain, and a abstract shank, and a partial pattern that it consists of a thin film of metals, such as aluminum formed by vacuum deposition or the electroless deposition method and chromium, is also included in a pattern printing layer by this invention. What is necessary is just to use a pattern as the aggregate of a transparent thing, a thing

with a margin, or a halftone dot, in order to enable fluoroscopy of the pattern of printing.

[0010] According to the application of the height of the workability which is, is usable as for a polyvinyl chloride, a polycarbonate, polyester, polyolefine, styrene resin, etc., and is demanded out of these although the layer of the transparent thermoplastics of a paralysis convex has the optimal acrylic resin and mold goods which are formed on a substrate or a sheet, ***** is suitably good.

When forming the layer of transparent resin on the substrate of acrylic resin, or a base material sheet, as for both adhesion, it is desirable to perform casting shaping especially using acrylic resin at a good point.

[0011] However, endurance, such as the abrasion resistance of a pattern and a water resisting property, is not needed so much, and the layer of thermoplastics transparent when a base material is a thick plate can be omitted, and it becomes the above mentioned fundamental mode.

[0012] The thickness of a layered product is easy to carry out bending and spinning to the range of the sum total of a substrate or a base material sheet, and the layer on it being 1-10mm and is desirable.

[0013] What is necessary is just to perform processing of a layered product by the known shaping approach as bending, such as a vacuum forming, press forming, and pressure forming, or a means of a diaphragm. What is necessary is just to determine a process condition suitably according to the shaping approach and the physical properties of an ingredient. For example, what is necessary is just to process it on conditions with a die temperature [of 80-160 degrees C], and an ingredient skin temperature of 100-200 degrees C, when a substrate and the thermoplastics on it carry out the vacuum forming of the layered product made of acrylic resin.

[0014] Concealment nature may also have a transparent thing, it responds to the design given to mold goods, and a coloring coating is ***** . Spreading of a coating is arbitration, such as a spray coat and brush coating.

[0015]

[Function] In the manufacture approach of this invention, since paint film formation is performed after processing a layered product, a paint film has the uniform depth of shade, and can manufacture the resin mold goods which present the beautiful appearance which does not have color nonuniformity in cooperation with a pattern printing layer.

[0016]

[Example] The transparent acrylic resin film "HBS-001" (Mitsubishi Rayon make) with a thickness of 75 micrometers was prepared as a thermoplastics film, and gravure of the pattern of a grain tone was carried out on it with the printing ink "VMC" (product made from a THE ink tech) of an acrylic resin-vinyl chloride vinyl acetate copolymer system. A pattern can look at a rear face through a fluoroscope through the margin section.

[0017] The printing side was turned up and it covered with this film at the bottom of shuttering, and the thing to which added 1% of benzoyl peroxide to the monomer of a methyl methacrylate as a catalyst, heated it to it, and it was made it to carry out a polymerization about 15% was slushed in this shuttering, and was inserted and heated with two plates from the upper and lower sides, the polymerization of the whole was carried out, and the layered product with a thickness of 5mm was manufactured.

[0018] After carrying out the vacuum forming of the above-mentioned layered product to the configuration which showed the cross section in drawing 2 in the die temperature of 110 degrees C, the acrylic resin film plane was made to apply and dry opaque enamel, and the coloring paint film was formed. The obtained resin mold goods do not have color nonuniformity, and had the beautiful appearance.

[0019]

[Effect of the Invention] According to the approach of this invention, a beautiful thing without color nonuniformity can be manufactured in the resin mold goods which have pattern printing of a pattern and the layer of a coloring coating which can be looked at through a fluoroscope.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The sectional view showing an example of the layered product prepared at the beginning of the process of the manufacture approach of this invention.

[Drawing 2] The sectional view showing the workpiece which processed and obtained the layered product of drawing 1 .

[Drawing 3] The sectional view showing what prepared the paint film of a coloring coating, i.e., the resin mold goods manufactured by the approach of this invention, in the workpiece of drawing 2 .

[Description of Notations]

- 1 Substrate of Transparent Thermoplastics
- 2 Pattern Printing Layer
- 3 Layer of Transparent Thermoplastics
- 4A Layered product
- 4B Workpiece
- 4C Mold goods
- 5 Paint Film of Coloring Coating

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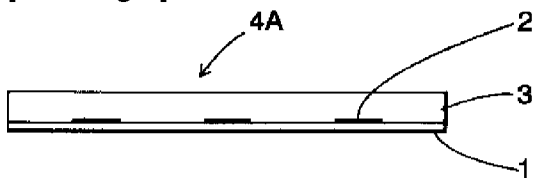
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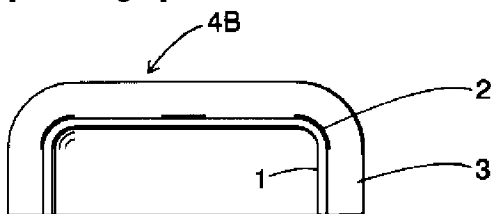
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DRAWINGS

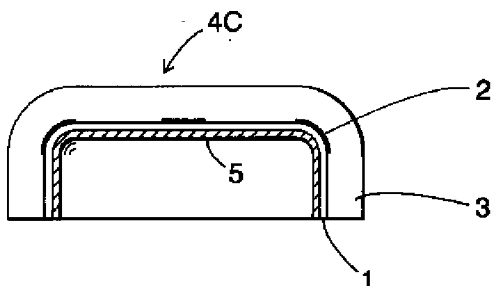
[Drawing 1]



[Drawing 2]



[Drawing 3]



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WRITTEN AMENDMENT

----- [a procedure revision]

[Filing Date] December 14, Heisei 4

[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] Claim 2

[Method of Amendment] Modification

[Proposed Amendment]

[Claim 2] The manufacture approach of the resin mold goods which prepare the pattern printing layer which had the pattern which can look at a rear face through

a fluoroscope on the base material sheet of transparent thermoplastics, or the substrate, form the layer of transparent thermoplastics on it, consider as a layered product, and consist this layered product of forming the paint film of a coloring coating in one field of a workpiece bending or after carrying out spinning.

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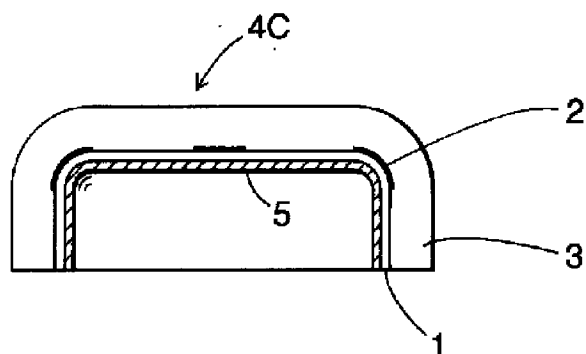
(21) 出願番号	特願平3-343676	(71) 出願人	000002897 大日本印刷株式会社 東京都新宿区市谷加賀町一丁目1番1号
(22) 出願日	平成3年(1991)12月25日	(72) 発明者	根津 義昭 東京都新宿区市谷加賀町一丁目1番1号 大日本印刷株式会社内
		(74) 代理人	弁理士 須賀 総夫

(54) 【発明の名称】 樹脂成形品の製造方法

(57) 【要約】

【構成】 透明な熱可塑性樹脂の基板の上に、透視可能なパターンをもった絵柄印刷層を設け、その上に透明な熱可塑性樹脂の層を形成して積層体し、この積層体を曲げまたは絞り加工した後に、加工品の一方の面に着色塗料の塗膜を形成する。 熱可塑性樹脂は、アクリル樹脂が好ましい。

【効果】 絵柄印刷層と着色塗料の塗膜との協同により、色ムラのない美しい外観の樹脂成形品を製造することができる。



【特許請求の範囲】

【請求項1】 透明な熱可塑性樹脂の基板の上に裏面を透視することのできるパターンをもった絵柄印刷層を設けて印刷体とし、この印刷体を曲げ加工または絞り加工した後に、加工品の一方の面に着色塗料の塗膜を形成することからなる樹脂成形品の製造方法。

【請求項2】 透明な熱可塑性樹脂の基材シートまたは基板上に裏面を透視することのできるパターンをもった絵柄印刷層を設け、その上に透明な熱可塑性樹脂の層を積層体とし、この積層体を曲げ加工または絞り加工した後に、加工品の一方の面に着色塗料の塗膜を形成することからなる樹脂成形品の製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、浴槽や各種の容器として使用するのに適した樹脂成形品の製造方法に関する。

【0002】

【従来の技術】 たとえば浴槽に用いる樹脂成形品は、透明な熱可塑性樹脂の成形品であって、外側に透視可能な絵柄印刷層を設け、さらにその上から着色ベタ印刷を行なった意匠を与えたものが多い。この種の成形品を製造する一つの方法は、熱可塑性樹脂の平板を絞り加工し、それに感熱転写法または水圧転写法によって絵付けを行なう方法である。しかし、感熱転写法では、形状が複雑である場合、たとえば深い凹部を有するような場合、絵柄印刷層を完全に転写することが難しく、絵柄が欠けてしまうことがある。水圧転写法にはこのような問題は無いが、工程が複雑で絵付けに時間がかかり、安価な製品が得られない。

【0003】 いまひとつの製造方法は、熱可塑性樹脂の平板に、透視可能な絵柄印刷層および着色ベタ印刷層を直接印刷するか、またはそれらを印刷した熱可塑性樹脂のフィルムを積層し、得られた積層体を曲げ加工することからなる。この方法で製造すると、着色ベタ印刷層を内側にして曲げ加工した部分は印刷層が縮んで密になって色が濃くなり、逆に着色ベタ印刷層を外側にして曲げ加工した部分は印刷層が伸びて粗になって色が薄くなる。ベタ印刷層の色に濃淡があると、絵柄印刷層との混色量に変化して、曲げ加工部分において模様の色相まで変化する。このため、得られる成形品は、色ムラのある品質の低いものであった。

【0004】

【発明が解決しようとする課題】 本発明の目的は、面倒な印刷手段を採用せずに実施でき、色ムラがなく美しい外観を有する樹脂成形品を製造する方法を提供することにある。

【0005】

【課題を解決するための手段】 本発明の樹脂成形品の製造方法の代表的で好ましい態様は、図1に示すように、透明な熱可塑性樹脂の基板または基材シート（1）の上

に透視可能なパターンをもった絵柄印刷層（2）を設け、その上に透明な熱可塑性樹脂の層（3）を形成して積層体（4A）とし、この積層体を、たとえば図2に示すような形状に曲げ加工または絞り加工した後に、加工品（4B）の一方の面に着色塗料の塗膜（5）を形成することからなる。このようにして、図3に示すような樹脂成形品（4C）が得られる。

【0006】 本発明の基本的態様は、基板または基材シート上に設ける透明な熱可塑性樹脂の層（3）の形成をしないで、直ちに加工に移るものである。

【0007】 透明な熱可塑性樹脂の基板または基材シートとする材料の例としては、ポリ（メタ）アクリル酸メチル、ポリ（メタ）アクリル酸エチル、ポリアクリル酸ブチルなどの（メタ）アクリル酸エステルの単独複合体または共重合体であるアクリル樹脂、スチレン系樹脂およびポリカーボネート樹脂が挙げられる。その高い加工性および透明性のゆえに好適なのは、とくにアクリル樹脂である。この上に透視可能なパターンをもった絵柄印刷層を設けるには、直接樹脂板またはシートに印刷を行なってもよいし、転写法によってもよい。絵柄の印刷は、スクリーン法、グラビア法など既知の手法に従えばよい。そのほかに、たとえば特開平2-131175号公報に記載されているような、ロール凹版の少なくとも凹部に電離放射線硬化性インキを充填し、その上に樹脂フィルムを重ね合わせ、電離放射線を照射してインキをフィルムに接着するとともに硬化させた後に、フィルムをロール凹版から剥がすことからなる、いわゆるドラムプリンティング法によって印刷してもよい。なお、ここでいう「透明」は、無色透明、着色透明、ツヤ消し透明のいずれをも包含する。着色透明またはツヤ消し透明にするには、既知の着色剤やツヤ消し剤を添加すればよい。

【0008】 印刷インキのビヒクルとしては、ポリ塩化ビニルまたは塩ビ・酢ビ共重合体とアクリル樹脂とを混合したものが、アクリル樹脂の基板またはシートを使用した場合、それとの密着性が良好で好ましい。そのほか、セルロース系、スチレン系など、印刷の対象とする材料に応じてえらぶ。

【0009】 絵柄は、石目、砂目、木目、抽象柄など任意であり、蒸着法や無電解メッキ法により形成したアルミニウム、クロム等の金属の薄膜からなる部分的模様も、本発明では絵柄印刷層に含まれる。印刷のパターンを透視可能にするには、絵柄を透明なもの、余白のあるもの、または網点の集合体にすればよい。

【0010】 基板またはシートの上に形成するいまひとつの透明な熱可塑性樹脂の層は、アクリル樹脂が最適であるが、ポリ塩化ビニル、ポリカーボネート、ポリエステル、ポリオレフィン、スチレン系樹脂なども使用可能であって、これらの中から、要求される加工性の高さや成形品の用途に応じて適宜にえらばよい。透明な樹

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脂の層をアクリル樹脂の基板または基材シート上に形成する場合、とくにアクリル樹脂を使用してキャストイング成形を行なうことが、両者の密着性がよい点で好ましい。

【0011】ただし、絵柄の耐摩耗性や耐水性等の耐久性をそれほど必要とせず、また基材が厚い板の場合は、透明な熱可塑性樹脂の層を省略することができ、前記した基本的態様となる。

【0012】積層体の厚さは、基板または基材シートとその上の層との合計が1～10mmの範囲であると、曲げ加工や絞り加工がしやすく好ましい。

【0013】積層体の加工は、真空成形、プレス成形、圧空成形など、曲げや絞りの手段として既知の成形方法によって行なえばよい。成形条件は、成形方法および材料の物性に依りて適宜に決定すればよい。たとえば、基板、その上の熱可塑性樹脂ともアクリル樹脂製の積層体を真空成形する場合は、金型温度80～160℃、材料表面温度100～200℃の条件で加工すればよい。

【0014】着色塗料は、透明なものでも隠蔽性のあるものでもよく、成形品に与える意匠に依りてえらぶ。塗料の塗布は、スプレーコート、ハケ塗りなど任意である。

【0015】

【作用】本発明の製造方法においては、積層体の加工をした後に塗膜形成を行なうので、塗膜は均一な色濃度を有し、絵柄印刷層と協同して色ムラのない美麗な外観を呈する樹脂成形品が製造できる。

【0016】

【実施例】熱可塑性樹脂フィルムとして厚さ75μmの透明なアクリル樹脂フィルム「HBS-001」（三菱レイヨン製）を用意し、その上に、アクリル樹脂-塩ビ酢ビ共重合体系の印刷インキ「VMC」（ザ・インクテック製）で、砂目調の絵柄をグラビア印刷した。絵柄

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は、余白部を通して裏面を透視することのできるものである。

【0017】型枠の底に、このフィルムを印刷面を上にして敷き、メタクリル酸メチルのモノマーに1%の過酸化ベンゾイルを触媒として加え、加熱して15%程度重合させたものを、この型枠内に流し込み、上下から2枚の板で挟んで加熱し、全体を重合させて厚さ5mmの積層体を製造した。

【0018】上記の積層体を、金型温度110℃において、断面を図2に示した形状に真空成形した後、アクリル樹脂フィルム面に、不透明なエナメル塗料を塗布し乾燥させて着色塗膜を形成した。得られた樹脂成形品は、色ムラがなく美麗な外観を有していた。

【0019】

【発明の効果】本発明の方法によれば、透視可能なパターンの絵柄印刷と着色塗料の層とを有する樹脂成形品において、色ムラのない美麗なものを製造することができる。

【図面の簡単な説明】

【図1】 本発明の製造方法の工程のはじめに用意する積層体の一例を示す断面図。

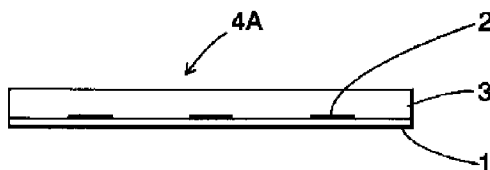
【図2】 図1の積層体を加工して得た加工品を示す断面図。

【図3】 図2の加工品に着色塗料の塗膜を設けたもの、すなわち本発明の方法で製造した樹脂成形品を示す断面図。

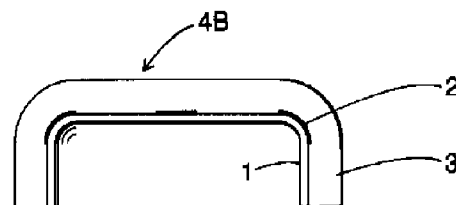
【符号の説明】

- 1 透明な熱可塑性樹脂の基板
- 2 絵柄印刷層
- 3 透明な熱可塑性樹脂の層
- 4A 積層体
- 4B 加工品
- 4C 成形品
- 5 着色塗料の塗膜

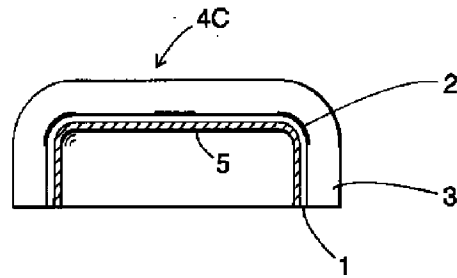
【図1】



【図2】



【図3】



【手続補正書】

【提出日】平成4年12月14日

【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】請求項2

【補正方法】変更

【補正内容】

【請求項2】 透明な熱可塑性樹脂の基材シートまたは基板上に裏面を透視することのできるパターンをもった絵柄印刷層を設け、その上に透明な熱可塑性樹脂の層を形成して積層体とし、この積層体を曲げ加工または絞り加工した後に、加工品の一方の面に着色塗料の塗膜を形成することからなる樹脂成形品の製造方法。